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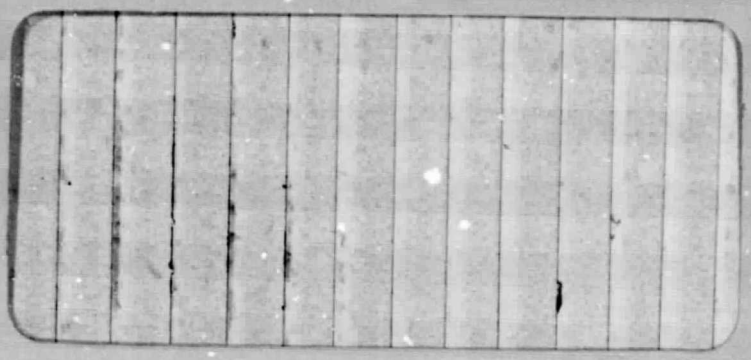

(E78-10174) RETRANSMISSION OF HYDROMETRIC DATA IN CANADA Quarterly Report, Apr. - Jun. 1978 (Department of the Environment, Ottawa) 8 p HC A02/MF A01 CSCL 08H

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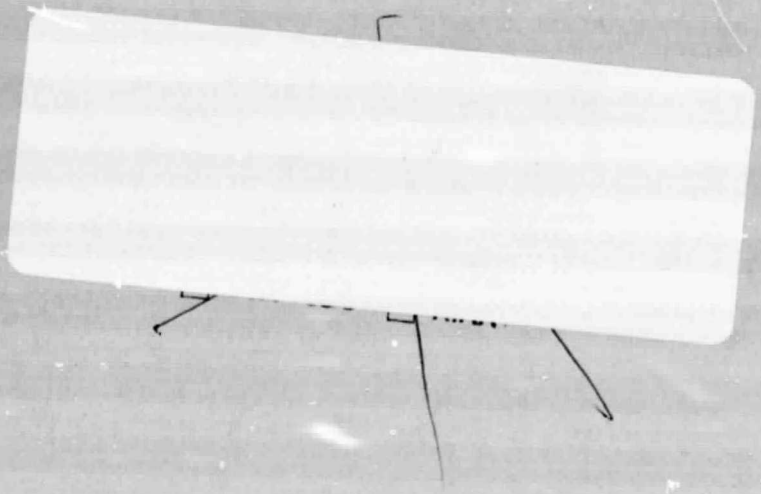

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Retransmission of Hydrometric Data in Canada

SR 28190

Applied Hydrology Division
Department of the Environment
Ottawa, Ontario, Canada
K1A 0E7

July, 1978

Quarterly Report for Period April-June 1978

I. INTRODUCTION

The Water Survey of Canada operates over 2400 hydrometric stations at which water level data are collected. Because of the remoteness of many of these stations, it usually is not economically feasible to telemeter data from the sites by conventional means. For this reason an experiment was conducted which involved transmitting data from stations by means of Landsat-1. The technical suitability of the system was demonstrated and in response to a demand for near real-time data from additional sites, it was decided to implement a larger network. In this way, it should be possible to determine the benefits and cost associated with a larger operational system.

II. TECHNIQUES

Data Collection Platforms have now been installed at 26 stations. An additional 7 DCPs may be installed in 1978. The sites (Figure 1, Table 1) were selected on the basis of real-time data needs for water management purposes. Water level data are transmitted from most sites, additional parameters, mainly meteorological are transmitted from some sites.

Water levels are sensed at Water Survey of Canada gauging stations by a float and pully or by servomanometer that senses the static pressure in a nitrogen purge system. Water level is usually recorded on a strip chart recorder. At the stations where DCPs are installed, an analogue to digital shaft position encoder (The Stevens Memomark II) is used to encode and store 16 bits (4 BCD digits) of water level data for transmittal by the DCP.

Precipitation data are obtained using a Fisher and Porter weighing type precipitation gauge. The gauge can be equipped with a Telekit for telemetering of data. The gauge is connected to a serial digital interface designed by Atmospheric Environment Service (AES) Department of the Environment. The interface is known as a Hydrometeorological Automatic Recording and Telemetering System (HARTS). Air temperature in the HARTS system is sensed by a platinum resistance bulk thermometer. A precision thermistor (YSI Series 400 probes) connected directly to the DCP is also used in some other cases. Recently AES relocated one of their two HARTs units.

The data transmitted by DCPs are processed by NASA, then sent to Canada in two ways. The first is by land line to the Canada Centre for Remote Sensing in Ottawa. The data usually arrives shortly after each orbit of the spacecraft. At CCRS, the data are recorded simultaneously on a teletype hard copier and on

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FIGURE 1

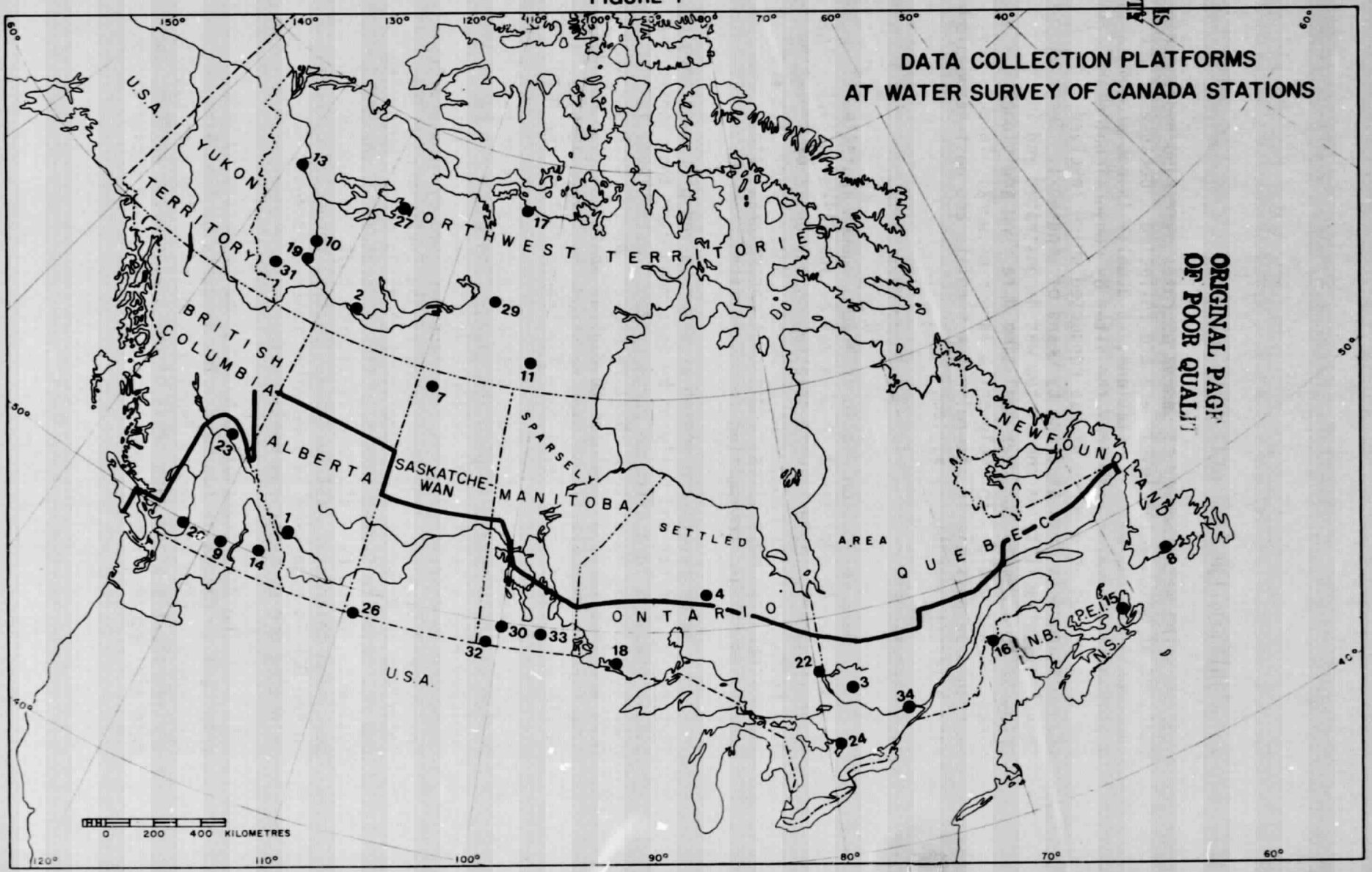

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TABLE 1

LOCATION OF DATA COLLECTION PLATFORMS

	HYDROMETRIC STATIONS	DCP	DATE INSTALLED	LAT.	LONG.
1)	Red Deer River below Burnt Timber Creek	6010	1978-06-02	51°39'	115°01'
2)	Mackenzie River near Fort Providence	6012	1978-06-10	61°15'	117°30'
3)	In Stores Calgary serviceable	6021			
4)	Albany River above Nottik Island	6102	1973-01-13	51°38'	86°24'
5)	In Stores Ottawa unserviceable	6126			
6)	In Stores Ottawa serviceable	6137			
7)	Lake Athabasca at Crackingstone Point	6150	1972-09-19	59°23'	108°53'
8)	Grey River near Grey River	6210	1976-09-13	47°45'	56°56'
9)	Snow Course No. 5A Mission Creek	6232	1975-10-31	49°47'	118°55'
10)	Mackenzie River near Wrigley	6260	1973-06-07	63°16'	123°36'
11)	Kazan River at Outlet of Ennadai Lake	6353	1972-09-19	61°16'	100°58'
12)	In Stores Vancouver serviceable	6354			
13)	Mackenzie River at Sans Sault Rapids	6366	1973-05-31	65°46'	128°45'
14)	Carney Creek below Pambrum Creek	6501	1977-05-20	50°10'	116°35'
15)	Cheticamp River above Robert Brook	6502	1978-04-20	46°38'	60°57'
16)	St. Francis River at Outlet of Glasier Lake (GOES)	6504	1977-03-22	47°12'	68°57'
17)	Ellice River near the Mouth	6507	1976-04-22	67°42'	104°08'
18)	Namakan Lake above Kettle Falls Dam	6511	1977-10-24	48°30'	92°38'
19)	Root River near the Mouth	6512	1975-07-15	62°29'	123°26'
20)	Nahatlatch River below Tachewana Creek	6514	1975-10-20	49°57'	121°52'
21)	In Stores Ottawa serviceable	6517			
22)	Blanche River above Englehart (GOES)	6521	1978-02-23	41°53'	79°53'
23)	McGregor River at Lower Canyon	6522	1977-06-07	54°16'	121°40'
24)	Severn River above Wasdell Falls	6524	1976-09-14	44°46'	79°18'
25)	In Stores Ottawa serviceable	6527			
26)	Battle Creek at International Boundary	6541	1975-10-22	49°00'	109°25'
27)	Sloan River near the Mouth	6542	1978-05-08	66°32'	117°16'
28)	In Stores Baker Lake serviceable	6544			
29)	Hanbury River above Hoare Lake	6547	1976-07-05	63°36'	105°09'
30)	Assiniboine River at Brandon	6571	1977-11-08	49°51'	99°56'
31)	South Nahanni River above Virginia Falls	6572	1975-07-15	61°38'	125°48'
32)	Souris River near Coulter (GOES)	6574	1978-04-19	49°05'	100°57'
33)	Assiniboine River at Headingley (GOES)	45617C14	1977-07-08	49°52'	97°24'

magnetic tape. A software data retrieval system sorts the user platforms, reformats the data into engineering units and stores individual user files on disk. The user may then access the data file, usually daily, using either a teletype or telex remote terminal.

The second way that data are received from NASA is by punched card and uncalibrated computer listings about two weeks after transmittal by the DCP. These data are delivered to the Canadian Embassy in Washington, D.C., then carried by diplomatic bag to the Department of External Affairs in Ottawa. External Affairs then mails the data to the user. The cards are run in computer programs that sort the data and perform the conversion to engineering units. Data produced in this way are used to generate statistics on DCP performance, for quality checks and archival purposes.

Since the beginning of the new year, it is possible for the users across Canada to receive reformatted Landsat message by Telex, 10 or 30 characters per second Teletype terminals from Prince Albert Satellite Station (PASS) located in the Province of Saskatchewan, Canada. The DCP processing system has all the hardware and software to receive, store, process and output the DCP messages to users using one of the 10 identification codes (ID).

In order to control access, the user must know the ID and the list of DCPs associated with the ID.

The user by a set of commands may request data as follows:

1. Formatted or raw (quality 5 or better).

2. All messages under one ID since last dissemination.

3. All messages from one ID since time t.

4. All messages for one specified DCP since last dissemination or since time t.

III. ACCOMPLISHMENTS

During the report period 26 DCPs (23 in Landsat mode and 3 in the GOES mode) were in service at remote stations across Canada. The DCPs in the Mackenzie River Basin that were turned off for the winter months were turned on in this report period.

DCP 6010 Red Deer River above Burnt Timber Creek was installed June 2, 1978 in response to a request from the Province of Alberta. The Government officials want water level readings high-up in the watershed for the purpose of flood warnings for the Red Deer River System. The cost of a land line to the site is prohibitive.

DCP 6126 stopped transmitting and sent to Ottawa for repairs. The fault was traced to defective power transistors on the output stage, Transmitter Board. Repairs have not been made due to the difficulty of procuring replacement parts.

DCP 6542 Sloan River near the Mouth was installed primarily for determining spring runoff conditions in the far north.

The installation of the GOES part of the Landsat/GOES System downlink has run into serious problems. The faulty bit synchronizer, however, has finally been returned by the manufacturer and is now being re-installed at PASS.

Users can access the Prince Albert Satellite Station (PASS) with Telex or on the 110 and 300 baud lines for DCPs on the Landsat mode.

IV. SIGNIFICANT RESULTS

The project continues to demonstrate the feasibility of transmitting hydrometric data in the Landsat and GOES mode and using these data operationally. All elements except for the GOES downlink at PASS are functioning well.

V. PUBLICATIONS

A Plan for the Collection and Transmission of Hydrometeorological Data in the Brasilian Amazon Basin by Robert A. Halliday dated April, 1978.

This is a report on a study funded by the World Meteorological Organization that recommends the implementation of the GOES Data Collection System deploying up to 100 DCPs.

VI. PROBLEMS

Problems with receiving GOES data at PASS.